REVISTA ESPAÑOLA DE FISIOLOGIA, 44 (1), 107-108, 1988

Effect of Vagotomy on Bile Acid Absorption by Rat Small Intestine *in vitro*

The bile acid absorption in the rat intestine occurs principally in the ileum by an active transport mechanism *in vitro* (1). Several researchers have described changes in the bile acid composition due to truncal vagotomy (4, 9, 10). It can be noted that after vagotomy the glucose absorption increased notably in both active and total transport (7). The experiments were designed to investigate the effect of vagotomy on bile acid absorption by the small intestine of the rat.

Sacs of everted low ileal segments from fed male or female Wistar rats were prepared as described (11), 15 days after a bilateral truncal subdiaphragmatic vagotomy or sham vagotomy. Each sac contained 2 ml of glucose Krebs-Ringer bicarbonate solution and was placed in a 50 ml beaker containing 10 ml of identical solution, and incubated with agitation for 60 min at 37° C. In all cases, the initial concentration of thaurocholic and glycocholic acids in both serosal and mucosal fluids was 100 μg/ml. At the end of 60 minute incubation the final mucosal and serosal concentrations of bile acids were measured chemically (2).

Statistical comparisons between inhibited and control groups were made using the «t» test.

The results of experiments (table I) demonstrate that at the end of incubation time the amount of bile acid removed from the serosal side of the sacs was greater than the amount that appeared in the free fluid of the mucosal compartment, suggesting some form of transport against the concentration gradient. On the other hand, when the bile acid concentrations of vagotomized and sham vagotomized rats were compared, no significant differences were seen betwen the values from the serosal side or the values from the mucosal side, in either group of rats.

The processes of bile acid absorption by the intestine are closely connected with the biliary composition (4). The absorption levels are modified by defects in the intestinal absorption mechanism and several authors consider the possibility that truncal vagotomy may produce these troubles (3). Vagotomy increased the absorption of glucose in the intestine of rats (7). In the present study not even the truncal vagotomy was found to have a statistically significant effect upon the absorption of the bile acids. MARK *et al.* (5) suggest that the alleged change of bile acid in biliary composition is not due to an effect on the liver. VAQUERO

Table I. *Transport of taurocholic and glycocholic acids by small intestine.*
Number of experiments per group, 12. No significant differences were seen of the concentrations of these bile acids, as much as mucosal and serosal sides of between the groups of rats vagotomized or sham vagotomized. Significant differences were found between the serosal and mucosal sides in both groups of animals. * $p < 0.001$.

	TAUROCHOLIC		GLYCOCHOLIC	
	Mucosal	Serosal	Mucosal	Serosal
Vagotomy	1.83 ± 0.22	3.21 ± 0.48*	0.80 ± 0.13	1.25 ± 0.19*
Sham vagotomy	1.87 ± 0.34	3.12 ± 0.63*	0.79 ± 0.16	1.23 ± 0.20*

and RUEDA (8) reported no significant changes in cholesterol synthesis in the liver after truncal vagotomy in the rat, and MEIJER *et al.* (6) noted that truncal vagotomy seemed to have an effect on enterohepatic circulation of bile salts.

In conclusion, the influence of vagotomy on biliary composition is far from clear and is still the subject of many experimental studies.

Key Words: Vagotomy, Bile acid, Intestinal absorption.

Palabras clave: Vagotomía, Acido biliar, Absorción intestinal.

References

1. Baker, R. D. and Searle, G. W.: *Proc. Soc. Exptl. Biol. Med.*, 105, 521-523, 1960.
2. Iwata, H. and Yamasaki, K.: *J. Biochem.*, 56, 424-431, 1964.
3. Kiekens, R. and Govaerts, P.: *Strasburg Méd.*, 15, 584-589, 1964.
4. Komaki, K.: *Archs. Jap. Chir.*, 45, 339-355, 1976.
5. Mack, E., Saito, C. and Patzer, E. M.: *J. Lab. Clin. Med.*, 97, 521-524, 1981.
6. Meijer, S., Visser, J. J., Rauwerdaj, M. and Hoitsma, H. F. W.: *Eur. Surg. Res.*, 13, 134-142, 1981.
7. Vázquez, J. M., Gómez-Bosque, P. and Vaquero, C.: *Cir. Esp.*, 1, 25-28, 1977.
8. Vaquero, C. and Rueda, J.: 2nd Nat. Congress Spanish Soc. Surgical Res., Madrid, 1982. p. 44. Abstract.
9. White, T. T., Tournut, R. A., Scharplatz, D., Havlie, H., Olson, A. D. and Hopton, D.: *Ann. Surg.*, 179, 406-411, 1974.
10. Wilbur, B. G., Gómez, F. C. and Tompkins, R. K.: *Arch. Surg.*, 110, 972-976, 1975.
11. Wilson, T. H. and Wiseman, G.: *J. Physiol.*, 123, 116-125, 1954.

C. VAQUERO, J. GONZÁLEZ-PEREA,
L. A. RODRIGUEZ-TOVES and M. V. DIAGO.

Laboratorio de Cirugía Experimental
Instituto de Investigaciones Médicas
Facultad de Medicina
47005 Valladolid (Spain)

(Received on November 17, 1986)

Correspondence to Dr. C. Vaquero.